

Attorney Docket No. LMND.P098C

In the claims:

1 Claims 1-56 (cancelled).

1 57. (Currently amended) A catheter for treating a vascular occlusion, comprising:  
2 an elongated shaft including a proximal section and a distal section, and at least  
3 one lumen extending from the proximal section to the distal section;  
4 two spreading members at the distal section of the elongated shaft, wherein each  
5 of the spreading members comprises a free distal end that moves laterally away from a  
6 longitudinal axis of the elongated shaft to disrupt the vascular occlusion; and  
7 an actuating assembly positioned along the elongated shaft to move the free distal  
8 ends of the two spreading members laterally in response to an actuation force, wherein  
9 the free distal ends of the spreading members are configured to apply a fracturing force to  
10 tissue including at least one of tissue of a blood vessel and tissue of the vascular  
11 occlusion and configured to support advancing the catheter through the tissue so that the  
12 tissue remains external to the catheter.

1 58. (Previously added) The catheter as recited in claim 57, wherein each of the two  
2 spreading members includes a cam follower on an interior of the spreading member.

1 59. (Previously added) The catheter as recited in claim 58, wherein the actuating  
2 assembly includes an actuation element including a distal end with a cam, wherein the  
3 cam is in contact with the cam follower to urge the spreading member in a substantially  
4 lateral direction.

1 60. (Previously added) The catheter as recited in claim 59, wherein the cam is  
2 configured as a central hub, and wherein the spreading member is urged in a substantially  
3 lateral direction when the cam is moved in a relatively proximal direction.

1 61. (Previously added) The catheter as recited in claim 59, wherein the cam is  
2 formed with an edge that slidably contacts the cam follower, and wherein the spreading

BEST AVAILABLE COPY

Attorney Docket No. LMND.P098C

3 member is urged in a substantially lateral direction when the cam is moved in a relatively  
4 distal direction.

1 Claims 62-63 (canceled).

1 64. (Withdrawn) The catheter as recited in claim 57, wherein the distal section of  
2 the elongated shaft comprises a hub about the elongated shaft.

1 65. (Withdrawn) The catheter as recited in claim 64, further comprising a collar  
2 section fitted about the hub.

1 66. (Withdrawn) The catheter as recited in claim 65, wherein the two spreading  
2 members and the collar section are parts of a unitary body.

1 67. (Previously added) The catheter as recited in claim 57, wherein the spreading  
2 member includes a substantially curved end.

1 68. (Previously added) The catheter as recited in claim 57, wherein the spreading  
2 member includes a substantially tapered end.

1 Claim 69 (canceled).

1 70. (Currently amended) An intravascular tissue expanding catheter, comprising:  
2 a catheter shaft formed of braided material, wherein the catheter shaft comprises  
3 at least one conduit extending along a longitudinal axis of the catheter shaft;  
4 a housing formed at a distal end of the catheter shaft, wherein the housing  
5 includes two deflecting members that each comprise a free distal tip that moves in a  
6 lateral direction away from the longitudinal axis of the catheter shaft to expand  
7 intravascular tissue; and  
8 an actuation assembly that moves the distal tips of the two deflecting members  
9 away from the longitudinal axis of the catheter shaft, wherein the distal tips of the

BEST AVAILABLE COPY

Attorney Docket No. LMND.P098C

10 deflecting members are configured to apply a fracturing force to the intravascular tissue  
11 including at least one of tissue of a blood vessel and tissue of the vascular occlusion and  
12 configured to support advancing the catheter through the intravascular tissue so that the  
13 intravascular tissue remains external to the catheter.

1 71. (Previously added) A catheter as in claim 70, wherein the two deflecting  
2 members each include an integrally formed hinge about which the distal tip of the  
3 deflecting member rotates.

1 72. (Previously added) A catheter as in claim 70, wherein the two deflecting  
2 members are each coupled to a discrete hinge about which the distal tip of the deflecting  
3 member rotates.

1 73. (Previously added) A catheter as in claim 70, wherein each of the two  
2 deflecting members includes an internal cam follower.

1 74. (Previously added) A catheter as in claim 73, wherein the actuation assembly  
2 includes a cam positioned within the housing for slidable movement along the cam  
3 followers of the two deflecting members to move the distal tips of the two deflecting  
4 members in a lateral direction.

1 75. (Withdrawn) A catheter as in claim 74, wherein the at least one conduit includes  
2 an actuation conduit, and wherein the catheter further comprises a push tube positioned  
3 relatively proximal to the cam follower within the actuation conduit.

1 76. (Withdrawn) A catheter as in claim 74, wherein the at least one conduit includes  
2 an actuation conduit, and wherein the catheter further comprises a rotational tube  
3 positioned relatively proximal to the cam follower within the actuation conduit.

BEST AVAILABLE COPY

Attorney Docket No. LMND.P098C

1 77. (Withdrawn) A catheter as in claim 74, wherein the at least one conduit includes  
2 an actuation conduit, and wherein the catheter further comprises a pulling element  
3 positioned relatively proximal to the cam follower within the actuation conduit.

1 78. (Currently amended) A catheter as in claim 70, wherein the actuation assembly  
2 includes at least one pulling element ~~connected~~ coupled to the two deflecting members.

1 79. (Withdrawn) A catheter as in claim 78, wherein each of the two deflecting  
2 members is connected to the housing with a hinge pin to form a hinge about which the  
3 distal tip rotates when the pulling element is pulled in a relatively proximal direction.

1 80. (Withdrawn) A catheter as in claim 78, wherein each of the two deflecting  
2 members and the housing are integrally formed of nitinol with a flexible hinge section  
3 about which the distal tip rotates when the pulling element is pulled in a relatively  
4 proximal direction.

1 Claim 81 (canceled).

1 82. (Withdrawn) A catheter as in claim 70, wherein the catheter shaft defines a  
2 guidewire conduit.

1 83. (Withdrawn) A catheter as in claim 82, wherein the guidewire conduit is offset  
2 from the longitudinal axis of the shaft.

1 84. (Currently amended) A catheter for use in vasculature, comprising:  
2 a catheter body comprising at least one conduit extending through the catheter  
3 body;  
4 two tissue expanding members coupled to a distal section of the catheter body,  
5 wherein each of the two tissue expanding members includes a proximal portion and a  
6 distal portion, and wherein the distal portion is free to move away from a longitudinal  
7 axis of the catheter body relative to the proximal portion; and

BEST AVAILABLE COPY

Attorney Docket No. LMND.P098C

8 an actuation assembly within the catheter body such that when the actuation  
9 assembly contacts the two tissue expanding members, the distal portions of the expanding  
10 members move away from the longitudinal axis, wherein the expanding members are  
11 configured to apply a fracturing force to tissue including at least one of tissue of a blood  
12 vessel and tissue of a vascular occlusion and configured to support advancing the catheter  
13 through the tissue so that the tissue remains external to the catheter.

1 85. (Withdrawn) A catheter as in claim 84, wherein the distal section of the catheter  
2 body includes a fixed extension, and wherein the proximal portions of the two tissue  
3 expanding members are coupled to the fixed extension with a hinge pin.

1 86. (Withdrawn) A catheter as in claim 85, wherein the actuation assembly includes  
2 at least one actuation wire coupled to the proximal portions of the two tissue expanding  
3 members, such that the distal portions of the two tissue expanding members move away  
4 from the longitudinal axis when the actuation wire is pulled in a proximal direction.

1 87. (Withdrawn) A catheter as in claim 86, wherein the distal section of the catheter  
2 body includes a guidewire lumen.

1 88. (Withdrawn) A catheter as in claim 87, wherein the hinge pin is positioned  
2 between the guidewire lumen and the actuation wire within the distal section of the  
3 catheter body.

1 89. (Withdrawn) A catheter as in claim 87, wherein the guidewire lumen is  
2 positioned between the hinge pin and the actuation wire within the distal section of the  
3 catheter body.

1 90. (Withdrawn) A catheter as in claim 89, further comprising a guidewire tube  
2 extension with an outer surface positioned along at least a portion of the fixed extension  
3 for enclosing a guidewire.

BEST AVAILABLE COPY

Attorney Docket No. LMND.P098C

1 91. (Withdrawn) A catheter as in claim 90, wherein the two tissue expanding  
2 members each include a surface that is complementary to the outer surface of the  
3 guidewire tube extension.

1 92. (Currently amended) An intravascular catheter, comprising:  
2 a catheter shaft including a distal end and a longitudinal axis having at least one  
3 lumen extending along the longitudinal axis of the catheter shaft;  
4 an assembly at the distal end of the catheter shaft including two deflecting  
5 members each defined by a free distal tip that moves in a lateral direction away from the  
6 longitudinal axis of the catheter shaft to expand vascular tissue, wherein the two  
7 deflecting members are hinged to the catheter shaft; and  
8 an actuating assembly positioned along the catheter shaft, the proximal movement  
9 of which moves the distal tip of the two deflecting members away from the longitudinal  
10 axis of the catheter shaft, wherein the deflecting members are configured to apply a  
11 fracturing force to tissue including at least one of tissue of a blood vessel and tissue of a  
12 vascular occlusion in the blood vessel and configured to support advancing the catheter  
13 through the tissue so that the tissue remains external to the catheter.

BEST AVAILABLE COPY